CBCS SCHEME

USN | | | | | | | | | | |

15ENG25

Second Semester B.Arch. Degree Examination, Jan./Feb. 2023
Building Structures – II

Time: 3 hrs. Max. Marks:100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define center of gravity and centroid. **(04 Marks)**

b. Determine the location of the centroid shown in Fig.Q1(b).

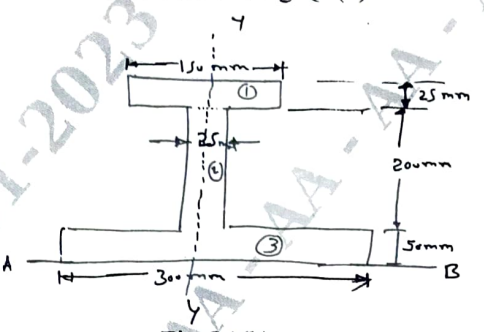

Fig.Q1(b) **(16 Marks)**

OR

2 a. State parallel axis theorem and briefly explain. **(04 Marks)**

b. Determine the location of the centroid shown in Fig.Q2(b).

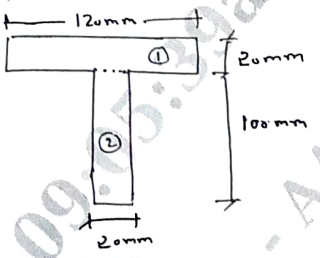

Fig.Q2(b) **(16 Marks)**

Module-2

3 a. Find the support reactions for the beam shown in Fig.Q3(a).

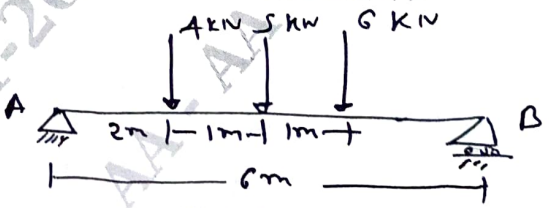

Fig.Q3(a) **(10 Marks)**

b. Find the support reactions show in Fig.Q3(b).

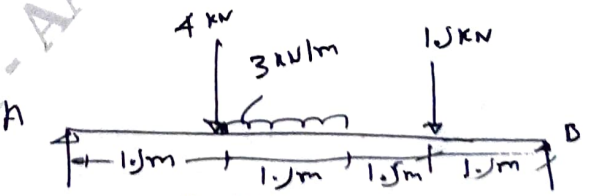

Fig.Q3(b) **(10 Marks)**

OR

4 a. Draw SFD and BMD for the beam shown in Fig.Q4(a).

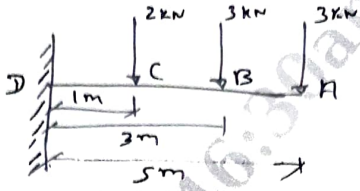

Fig.Q4(a) **(10 Marks)**

b. Draw SFD and BMD for the bema shown in Fig.Q4(b).

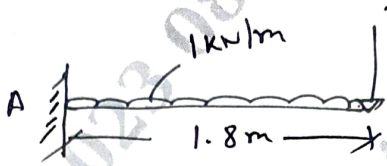

Fig.Q4(b) **(10 Marks)**

Module-3

5 a. What are the assumptions made in theory a simple bending? **(04 Marks)**

b. A rectangular beam, simply supported over a span of 4m is carrying a uniformly distributed load of 50kN/m. Find the dimensions of the beam, if the depth of beam section is 2.5 times its width. Take maximum bending stress in the beam section as 60 N/mm^2. **(16 Marks)**

OR

6 a. Provide the expression for finding the section modulus for :

i) Rectangular section
ii) Circular section
iii) Hollow rectangular section
iv) Hollow circular section. **(04 Marks)**

b. Calculate the maximum deflection at the free end of the cantilever of 3m span 100mm wide and 150mm deep in section, carrying a UDl of 10 kN/m. Take E = 2×10^5 N/mm^2. **(16 Marks)**

Module-4

7 a. Differentiate between long column and short column. **(04 Marks)**

b. A solid round bar 60mm in diameter and 2.5m long is used as strut. One end of the strut is fixed, while its other end is hinged. Find the safe compressible load for this strut using Euler's formula. Take E = 2×10^5N/mm^2 and factor of safety as 3. **(16 Marks)**

OR

8 A hollow section of external diameter 60mm and thickness 5mm and 2.5m long is used as a column. One end is fixed, while other end is hinged. Find the safe compressive load using Euler's formula. Take E = 2×10^5N/mm^2. Factor of safety 3. **(20 Marks)**

Module-5

9 A reinforced concrete column 500 × 500mm^2 in section is Reinforced with 4 steel bars of 25mm diameter placed one at each corner. The column carries an axial load of 2000kN. Find the stresses in concrete and steel bars. Take $E_s = 2.1 \times 10^5$ N/mm^2, $E_C = 0.14 \times 10^5$ N/mm^2. **(20 Marks)**

OR

10 A reinforced concrete column is 300 mm × 300mm in section. The column is provided with 8 bars of 20mm diameter. The column carries a load of 360kN. Find the stress in concrete and steel bars. Find the load shared by each material. Take $E_s = 2 \times 10^5$ N/mm^2 and $E_C = 0.14 \times 10^5$ N/mm^2. **(20 Marks)**

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